

CLAIMS

WHAT IS CLAIMED IS:

Sub A1 1. A thermal diffuser comprising:

a plate-shaped structure provided with a wall on the fringing part and welded or
5 bonded to the case of an electronic component via the wall; and
a plurality of protrusions provided in a region surrounded by said wall, case, and
plate-shaped structure and forming a channel in a mesh through which a heat medium
confined in the region recirculates.

2. A thermal diffuser comprising:

10 a housing having an outer wall capable of being thermally coupled with the case of
an electronic component which is to undergo heat exchange with an exterior; and
a plurality of protrusions protrudingly provided on the inner wall of said housing and
forming a channel in a mesh through which a heat medium confined inside said housing
recirculates, and wherein
15 said housing has thermal resistance at such a value that the heat exchange can be
achieved between the exterior and the channel.

3. A thermal diffuser comprising:

a frame formed integrally with the case of an electronic component which is to
undergo heat exchange with an exterior; and
20 a plurality of protrusions protrudingly provided on the inner wall of said frame and
forming a channel in a mesh through which a heat medium confined inside said frame
recirculates, and wherein
said frame has thermal resistance at such a value that the heat exchange can be
achieved between the exterior and the channel.

25 4. The thermal diffuser according to claim 1, further comprising

a heat medium injection path formed through said wall and used for injection of the heat medium to the channel from the exterior.

5. The thermal diffuser according to claim 2, further comprising

a heat medium injection path formed through said inner wall and used for injection of the heat medium to the channel from the exterior.

6. The thermal diffuser according to claim 3, further comprising

a heat medium injection path formed through said inner wall and used for injection of the heat medium to the channel from the exterior.

7. The thermal diffuser according to claim 1, wherein

the channel is formed thickly in a region near a device or a circuit which is provided in the electronic component and is to undergo the heat exchange.

8. The thermal diffuser according to claim 2, wherein

the channel is formed thickly in a region near a device or a circuit which is provided in the electronic component and is to undergo the heat exchange.

9. The thermal diffuser according to claim 3, wherein

the channel is formed thickly in a region near a device or a circuit which is provided in the electronic component and is to undergo the heat exchange.

10. The thermal diffuser according to claim 1, wherein

the channel is formed with uniform density in a region distant from a device or a circuit which is provided in the electronic component and is to undergo the heat exchange.

11. The thermal diffuser according to claim 2, wherein

the channel is formed with uniform density in a region distant from a device or a circuit which is provided in the electronic component and is to undergo the heat exchange.

12. The thermal diffuser according to claim 3, wherein

the channel is formed with uniform density in a region distant from a device or a circuit which is provided in the electronic component and is to undergo the heat exchange.

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H circuit which is provided in the electronic component and is to undergo the heat exchange.

13. The thermal diffuser according to claim 1, wherein

14. all or a part of said plurality of protrusions has/have a shape and a size large enough
to have a channel formed on the top part.

5 14. The thermal diffuser according to claim 2, wherein

15. all or a part of said plurality of protrusions has/have a shape and a size large enough
to have a channel formed on the top part.

15. The thermal diffuser according to claim 3, wherein

10 all or a part of said plurality of protrusions has/have a shape and a size large enough
to have a channel formed on the top part.

16. The thermal diffuser according to claim 1, wherein

15 all or a part of said plurality of protrusions is/are formed in a partly contracted pillar
or wedge shape.

17. The thermal diffuser according to claim 2, wherein

20 all or a part of said plurality of protrusions is/are formed in a partly contracted pillar
or wedge shape.

18. The thermal diffuser according to claim 3, wherein

all or a part of said plurality of protrusions is/are formed in a partly contracted pillar
or wedge shape.

20 19. The thermal diffuser according to claim 1, wherein

the ingredients, shapes, and sizes of said plurality of protrusions and/or said inner
wall are determined to allow capillary attraction acting on the heat medium in the channel to
promote recirculation of the heat medium.

20. The thermal diffuser according to claim 2, wherein

25 the ingredients, shapes, and sizes of said plurality of protrusions and/or said inner

wall are determined to allow capillary attraction acting on the heat medium in the channel to promote recirculation of the heat medium.

21. The thermal diffuser according to claim 3, wherein

the ingredients, shapes, and sizes of said plurality of protrusions and/or said inner

5 wall are determined to allow capillary attraction acting on the heat medium in the channel to promote recirculation of the heat medium.

22. The thermal diffuser according to claim 1, further comprising

a medium poured in all or a part of sections of the channel, for increasing capillary attraction acting on the heat medium in the channel.

10 23. The thermal diffuser according to claim 2, further comprising

a medium poured in all or a part of sections of the channel, for increasing capillary attraction acting on the heat medium in the channel.

24. The thermal diffuser according to claim 3, further comprising

a medium poured in all or a part of sections of the channel, for increasing capillary attraction acting on the heat medium in the channel.

15 25. The thermal diffuser according to claim 1, wherein

all or a part of said plurality of protrusions has/have a hole formed which is used for joining and/or coupling the thermal diffuser with said case or a member used for fastening the thermal diffuser in order to maintain thermal coupling with said case.

20 26. The thermal diffuser according to claim 2, wherein

all or a part of said plurality of protrusions has/have a hole formed which is used for joining and/or coupling the thermal diffuser with said case or a member used for fastening the thermal diffuser in order to maintain thermal coupling with said case.

27. The thermal diffuser according to claim 3, wherein

25 all or a part of said plurality of protrusions has/have a hole formed which is used for

joining and/or coupling the thermal diffuser with said case or a member used for fastening the thermal diffuser in order to maintain thermal coupling with said case.

28. The thermal diffuser according to claim 1, further comprising

a member used for joining and/or coupling the thermal diffuser with said case or a member used for fastening the thermal diffuser in order to maintain thermal coupling with said case, and integrally formed with all or a part of said plurality of protrusions individually.

29. The thermal diffuser according to claim 2, further comprising

a member used for joining and/or coupling the thermal diffuser with said case or a member used for fastening the thermal diffuser in order to maintain thermal coupling with said case, and integrally formed with all or a part of said plurality of protrusions individually.

30. The thermal diffuser according to claim 3, further comprising

a member used for joining and/or coupling the thermal diffuser with said case or a member used for fastening the thermal diffuser in order to maintain thermal coupling with said case, and integrally formed with all or a part of said plurality of protrusions individually.

15 31. The thermal diffuser according to claim 1, wherein

a total amount of the heat medium is set at an amount to allow the heat medium to steadily recirculate in a part of the channel being most closely thermally coupled with the electronic component.

32. The thermal diffuser according to claim 2, wherein

20 a total amount of the heat medium is set at an amount to allow the heat medium to steadily recirculate in a part of the channel being most firmly thermally coupled with the electronic component.

33. The thermal diffuser according to claim 3, wherein

a total amount of the heat medium is set at an amount to allow the heat medium to 25 steadily recirculate in a part of the channel being most firmly thermally coupled with the

electronic component.

34. The thermal diffuser according to claim 1, wherein
said plate-like structure has a shape and an ingredient such that the degree of
thermal coupling with the exterior or a specific member becomes a desired value.

5 35. The thermal diffuser according to claim 2, wherein
said outer wall has a shape and an ingredient such that the degree of thermal
coupling with the exterior or a specific member becomes a desired value.

36. The thermal diffuser according to claim 3, wherein
the outer wall of said frame is set to have a shape and an ingredient such that the
degree of thermal coupling with the exterior or a specific member becomes a desired value.

10 37. A radiator comprising:
a thermal diffuser comprising a plate-shaped structure provided with a wall on the
fringing part and welded or bonded to the case of an electronic component via the wall, and
a plurality of protrusions provided in a region surrounded by said wall, case, and plate-
shaped structure and forming a channel in a mesh through which a heat medium confined in
15 the region recirculates; and

a radiating member thermally coupled with the outer wall of said thermal diffuser,
for radiating heat transferred via said thermal diffuser to an exterior.

38. A radiator comprising:
20 a thermal diffuser comprising a housing having an outer wall capable of being
thermally coupled with the case of an electronic component which is to undergo heat
exchange with an exterior, and a plurality of protrusions protrudingly provided on the inner
wall of said housing and forming a channel in a mesh through which a heat medium confined
inside said housing recirculates; and

25 a radiating member thermally coupled with the outer wall of said thermal diffuser,

for radiating heat transferred via said thermal diffuser to an exterior, and wherein
said housing has thermal resistance at such a value that the heat exchange can be
achieved between the exterior and the channel.

39. A radiator comprising:

5 a thermal diffuser comprising a frame formed integrally with the case of an electronic
component which is to undergo heat exchange with an exterior, and a plurality of protrusions
protrudingly provided on the inner wall of said frame and forming a channel in a mesh
through which a heat medium confined inside said frame recirculates; and

10 a radiating member thermally coupled with the outer wall of said thermal diffuser,

10 for radiating heat transferred via said thermal diffuser to an exterior, and wherein

15 said frame has thermal resistance at such a value that the heat exchange can be
achieved between the exterior and the channel.

40. A radiator comprising:

15 a thermal diffuser comprising a plate-shaped structure provided with a wall on the
fringing part and welded or bonded to the case of an electronic component via the wall, and
a plurality of protrusions provided in a region surrounded by said wall, case, and plate-
shaped structure and forming a channel in a mesh through which a heat medium confined in
the region recirculates; and

20 a radiating member integrally formed with said thermal diffuser on the outer wall of

20 said thermal diffuser, for radiating heat transferred via said thermal diffuser to an exterior.

41. A radiator comprising:

25 a thermal diffuser comprising a housing having an outer wall capable of being
thermally coupled with the case of an electronic component which is to undergo heat
exchange with an exterior, and a plurality of protrusions protrudingly provided on the inner
wall of said housing and forming a channel in a mesh through which a heat medium confined

inside said housing recirculates; and

a radiating member integrally formed with said thermal diffuser on the outer wall of said thermal diffuser, for radiating heat transferred via said thermal diffuser to an exterior, and wherein

5 said housing has thermal resistance at such a value that the heat exchange can be achieved between the exterior and the channel.

42. A radiator comprising:

a thermal diffuser comprising a frame formed integrally with the case of an electronic component which is to undergo heat exchange with an exterior, and a plurality of protrusions 10 protrudingly provided on the inner wall of said frame and forming a channel in a mesh through which a heat medium confined inside said frame recirculates; and

a radiating member integrally formed with said thermal diffuser on the outer wall of said thermal diffuser, for radiating heat transferred via said thermal diffuser to an exterior, and wherein

15 said frame has thermal resistance at such a value that the heat exchange can be achieved between the exterior and the channel.